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OPERATIONAL PLAN

FOR

PSC 13 REMEDIATION AND SUPPLEMENTAL RADIOLOGICAL SUPPORT

FOR

THE NAVAL AIR STATION

JACKSONVILLE, FLORIDA

Prepared for

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

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Prepared by

BECHTEL ENVIRONMENTAL, INC.
OAK RIDGE, TENNESSEE

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REVISION 0

Bechtel Job No. 22567

Prepared: D. Amis for D. Freas
Senior Scientist

4/11/95
Date

Approved: [Signature]
Project Manager

4/11/95
Date

Approved: _____
RPM SOUTH DIV NAVFAC

Date

Approved: _____
RASO

Date

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FIGURE

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OPERATIONAL PLAN FOR PSC 13 REMEDiation AND SUPPLEMENTAL RADIOLOGICAL SUPPORT

1.0 INTRODUCTION

Two separate operations will be performed at PSC 13 that will require soil sampling and analytical support efforts. The first effort, Phase I, will involve the removal of radioactively contaminated surface and subsurface soil. The contaminated areas have been identified by both radiological surveys and subsurface soil analyses, and remediation efforts have been planned. Post-remediation monitoring and select soil sampling and radiological analysis will be used to verify that the remediated areas contain less than 5 pCi/g of Ra-226 and to characterize the waste products generated.

Phase II will involve radiation monitoring, soil sampling, and radiological analyses to ensure that excavations required for building construction will not involve exposure to subsurface contamination not identified in previous radiation surveys. Specifically, locations to be excavated for building footers and underground utility services will be monitored and sampled as needed in this effort.

2.0 PURPOSE

The purpose of this document is to define the tasks associated with radiological remediation of PSC 13 and the radiological support requirements for this effort, and for subsequent verification for future construction activities. Prior to initiating the tasks defined in the following sections, the Bechtel PM, the SouthDIV RPM, and the RASO shall concur with this task description as necessary for completing the remediation of PSC 13.

3.0 NAS-JAX SUPPORT REQUIREMENTS

3.1 SURFACE PREPARATION

PSC 13 shall be cleared of equipment, fencing, structures, and stored components prior to the start of remediation (Phase I).

3.2 LOCATION OF UNDERGROUND STRUCTURES

The exact locations of proposed building footers and underground services shall be identified to Bechtel prior to initiating soil sampling and in situ analysis in support of ongoing construction activities (Phase II).

4.0 MAJOR WORK FUNCTIONS

4.1 PHASE I - REMEDIATION AND VERIFICATION

- Mobilize equipment, supplies, and staff at PSC 13

- Perform pre-remediation rad surveys to distinctly identify areas to be remediated. Mark these areas.
- Remove surface blacktop/concrete in remediation areas and place in roll-off waste containers.
- Resurvey remediated areas to determine if the radiological cleanup criteria have been satisfied.
- Continue surface removal (in 6-in. lifts), radiation surveying, and waste disposal until cleanup criteria are satisfied in each remediation area.
- Obtain surface soil samples from the remediated areas for radiological analyses: approximately one composited sample from each 10 m² of excavation or approximately 10 samples.
- Obtain one composited soil sample from each roll-off waste container (approximately 7) for both radiological and TCLP analyses.
- Secure each waste container and transport them to a temporary waste storage area at PSC 26.
- When each remediated area has been declared clean by both analytical and rad survey results, backfill the area with clean borrow soil.
- Decontaminate equipment and demobilize the work site at PSC 13.

4.2 PHASE II - CONSTRUCTION SUPPORT SURVEYS

- Determine exact locations of subsurface excavation for building construction (i.e., footers and underground utility services)
- Mobilize staff, equipment, and supplies for borehole development, radiation monitoring, and soil sample collection.
- Obtain a surface radiation reading at each location to be surveyed (It is estimated that 40 locations may be involved.)
- Bore a hole at each location to a depth of 3 ft.
- Perform downhole radiation monitoring in each borehole.
- If locations in boreholes are found that exceed the radiation cleanup criteria (i.e., background plus 4,750 cpm) obtain a sample at that location.
- Have all soil samples analyzed for radiological concentrations.
- If analytical findings indicate that remediation is required, plans for these efforts will be developed.

5.0 OPERATIONS

5.1 PHASE I - REMEDIATION AND CLEANUP VERIFICATION

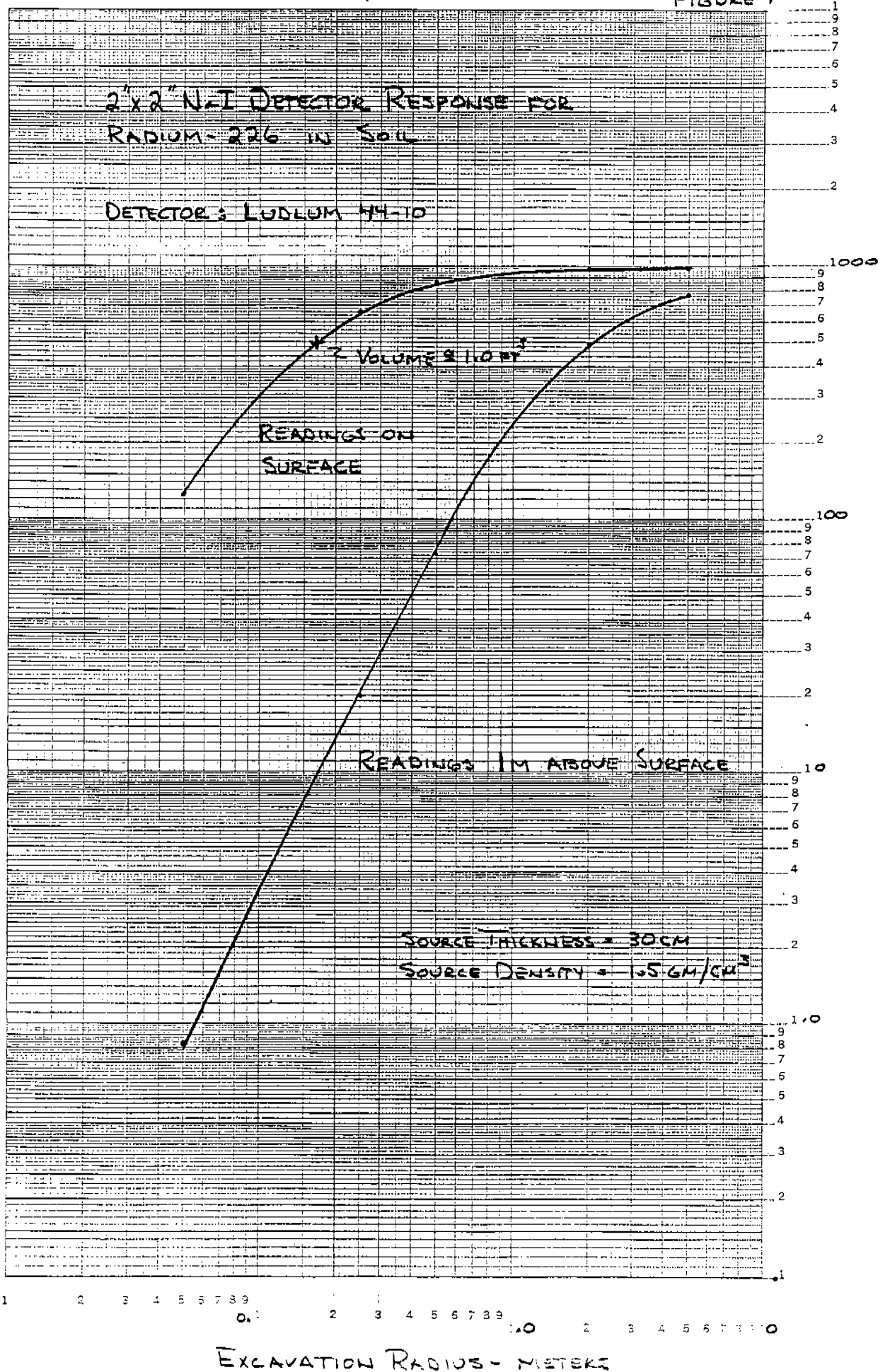
- Develop the background radiation level by obtaining about seven one-minute gamma radiation readings near the gate to PSC 13 or in locations away from storage or laydown areas (i.e., away from potential radiation sources). Average these readings (taken with a 2"x2" NaI detector) and use as the background level for remediation.
- Use the background radiation level plus 4,750 cpm (5 pCi/g Ra-226 equivalence) as the cleanup criteria. This criteria is based on the response of a 2"x2" NaI detector to radium-226 uniformly distributed in soil of large excavations (radius > 3 ft). For smaller holes, use relationships derived from Figure 1.
- Resurvey each suspected area with reported rad levels exceeding the cleanup criteria and mark (spray paint) for remediation.
- Stage equipment needed for remediation operations and waste material processing.
- Using appropriate equipment, section the surface blacktop/concrete where radiation surveys have indicated that removal is required.
- Remove the blacktop/concrete sections and place in contaminated-waste containers (roll-off containers).
- Resurvey the areas where the surface blacktop/concrete has been removed to determine if further surface removal is needed (i.e., radiation levels greater than cleanup criteria).
- If further remediation is needed, carefully remove about 6 in. of surface soil/stone using an appropriately-sized backhoe. Place material in the contaminated-waste containers. Use necessary measures to control dust and potential airborne contaminants.
- Resurvey remediated areas to determine if the cleanup criteria have been satisfied.
- Continue surface removal operations in locations where radiation levels exceed cleanup criteria until the radiation levels are satisfactory. Removal is to be performed in 6-in. lifts.
- During placement of waste in the waste containers, five random samples are to be collected from each container and composited.
- Submit the analytical samples for radiological and TCLP analyses to characterize the waste for eventual disposal. Ensure that samples are submitted in a timely fashion, are properly prepared, and are analyzed at a laboratory approved by the disposal agency.
- Secure each waste container to prevent spillage and transport them to a temporary storage area at PSC 26.

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LOGARITHMIC 5 x 3 CYCLES
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DETECTOR RESPONSE - $\frac{\text{CPM}}{\text{PC/gm}}$



- When radiation levels at each remediation area has been reduced to below cleanup criteria, perform final radiation surveys and document the results.
- Collect soil samples in each remediated area. Five surface samples are to be collected for each 10^2 of area and are to be composited for one radiological sample. It is estimated that 10 samples may be required. Radiological analyses are to be performed on a two-day turnaround.
- If analytical results verify remediated areas as being radiologically acceptable, each area shall be backfilled with borrow soil previously characterized as clean.
- If analytical data does not verify remediated areas as being radiologically acceptable, the surface removal and survey/analyses operations shall be continued until acceptable conditions result.
- Decontaminate equipment, process waste products, and demobilize the PSC 13 area.

5.2 PHASE II - CONSTRUCTION SUPPORT STUDIES

- Develop the background radiation level by obtaining about seven one-minute gamma radiation readings near the gate to PSC 13 or in locations away from storage or laydown areas (i.e., away from potential radiation sources). Average these readings (taken with a 2"x2" NaI detector) and use as the background level for remediation.
- Use two times the background radiation level as the trigger value for soil sampling and analysis.
- Identify the exact locations of planned subsurface excavations for building construction (i.e., footers and underground utility service lines) for borehole/radiation monitoring operations.
- Obtain a surface radiation reading at each borehole location. It is estimated that 40 locations may be involved.
- Obtain a surface soil sample at all locations exceeding the radiation trigger value.
- Bore a hole at each location to a depth of 3 ft.
- Perform downhole radiation monitoring during the boring operations to determine if the radiation trigger value has been exceeded. Take rad readings at each 1-ft depth.
- Collect soil samples at downhole locations where the radiation trigger value has been exceeded. If more than one sample is taken in a hole, composite the samples to generate one analytical sample.
- Analyze each soil sample for radiological concentrations.
- If analyses indicate that potential radiation hazards may exist during construction excavations, appropriate planning will be required to alleviate these conditions.